

Work Order ID 59551

Monday, June 07, 2010 1:56:50 PM

Page 1

Item ID: D350-748-241TRN

Accept

Setup Start

Stop

Revision ID:

Item Name: Crosstube Turning Detail

Start Date: 6/7/2010 Start Qty: 1.00

Required Date: 6/11/2010 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Run Start

Stop

Approvals:

Process Plan:

Date: 10-08-05

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D350-748-241	Rev E								
100	MORI SEIKI CNC LATHE LARGE	0.00							
Mori Seiki	Memo	0.00							
Mori Seiki CNC Lathe Large	1-Fill tube with sand & install plugs on both ends as per Folio FA647 2-Turn first side as per Folio FA647 3- File transition lines smooth.								
110	QC1- Inspect dimensions to dimension sheet	0.00							
QC	Memo	0.00							
Quality Control									
120	MORI SEIKI CNC LATHE LARGE	0.00							
Mori Seiki	Memo	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA647 2- File transition lines smooth. 3-Scribe part # as per Dwg D350-748-241								

Q.M. 10-06-10

Q.M. 10-06-10

Q.M. 10-06-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

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130 QC Quality Control	QC1- Inspect dimensions to dimension sheet Memo	0.00 0.00							Q.M. 10-06-10 (1)
140 QC Quality Control	QC8- Inspect parts - second check Memo	0.00 0.00							(IX) MB 10-06-10
150 Crosstubes Crosstubes	Large Fab Memo Grind machining marks.	0.00 0.00							(IX) MB 10-06-10

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Customer:

Setup Start

Stop

Run Start

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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160  Outsource1 Outsource process - Heat Treat	Memo Issue P/O: <u>12209</u> Heat Treat to min 180 KSI As per Dwg D350-748-241 Sand Blast tube after Heat Treat Possible Supplier: Vac Aero Ensure Certificate of Conformity is attached	0.00 0.00							CL 10/7/06 ①
170  Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs Memo Ensure certificate of conformaty is attached	0.00 0.00							CV 10/7/22 ①
180  QC Quality Control	QC6- Inspect dimensions to drawing Memo	0.00 0.00							④

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Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

190



Packaging

Packaging

Packaging

Memo

Identify and stock in kanban rack

Location: 46

0.00

0.00

DD

10-8-5

200



QC

Quality Control

QC21- Final Inspection - Work Order Release

Memo

0.00

0.00

10/08/05

mf

10-08-05

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Picklist Print

Monday, June 07, 2010 1:56:55 PM

Page 1

Work Order ID: 59551

Parent Item: D350-748-241TRN

Parent Item Name: Crosstube Turning Detail


Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec
IPP Rev B Removed polish 08.04.02 EC verified by : DD
IPP Rev C Removed LPS-3 08.06.23 Ec verified by: DD

Start Date: 6/7/2010

Required Date: 6/11/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Qty per Kit	Total	Qty	Date	Status
D6018-125		Manufactured	No			120	Each	50.0000	1	1			
													
Crosstube Material													

Location

Loc Qty

Loc Code

LG	50
32913	50



Q.A 10-06-10 @

1

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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DART AEROSPACE LTD		Work Order:	
Description: Crosstube Assembly (AS350/355 High Aft)		Part Number:	D350-748-241
Inspection Dwg: D350-748-241 Rev: D		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.245	/		
	2.180	+0.005/-0.000	2.185	/		
	2.180	+0.005/-0.000	2.185	/		
	2.208	+0.005/-0.000	2.213	/		
	2.234	+0.005/-0.000	2.239	/		
	2.253	+0.005/-0.000	2.258	/		
	2.272	+0.005/-0.000	2.277	/		
	2.299	+0.005/-0.000	2.304	/		
	0.063	+/-0.010	0.063	/		
	4.26	+/-0.030	4.260	/		
	R0.063	+/-0.010	R0.063	/		
	R0.50	+/-0.030	R0.500	/		
SIDE B	2.240	+0.005/-0.000	2.245	/		
	2.180	+0.005/-0.000	2.185	/		
	2.180	+0.005/-0.000	2.185	/		
	2.208	+0.005/-0.000	2.213	/		
	2.234	+0.005/-0.000	2.239	/		
	2.253	+0.005/-0.000	2.258	/		
	2.272	+0.005/-0.000	2.277	/		
	2.299	+0.005/-0.000	2.304	/		
	0.063	+/-0.010	0.063	/		
	4.26	+/-0.030	4.260	/		
	R0.063	+/-0.010	R0.063	/		
	R0.50	+/-0.030	R0.500	/		
	122.70	+/-0.060	122.700	/		

Measured by: Q.H.	Audited by: MB	Prototype Approval:	N/A
Date: 10-06-10	Date: 10-06-10	Date:	N/A
Rev	Date	Change	Revised by Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM

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Item	Qty	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6018-125	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AEIS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6018-125
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

59551

RELEASED
2009-10-29

E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	RF		
DRAWN	RF		
CHECKED	RF		
MFG. APPR.	RF		
APPROVED	RF		
DE APPR.	RF		
DATE	09.09.30		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. D350-748-241
TITLE CROSSTUBE (AS 350/355 HI AFT)

REV. E SHEET 1 OF 4
SCALE NTS

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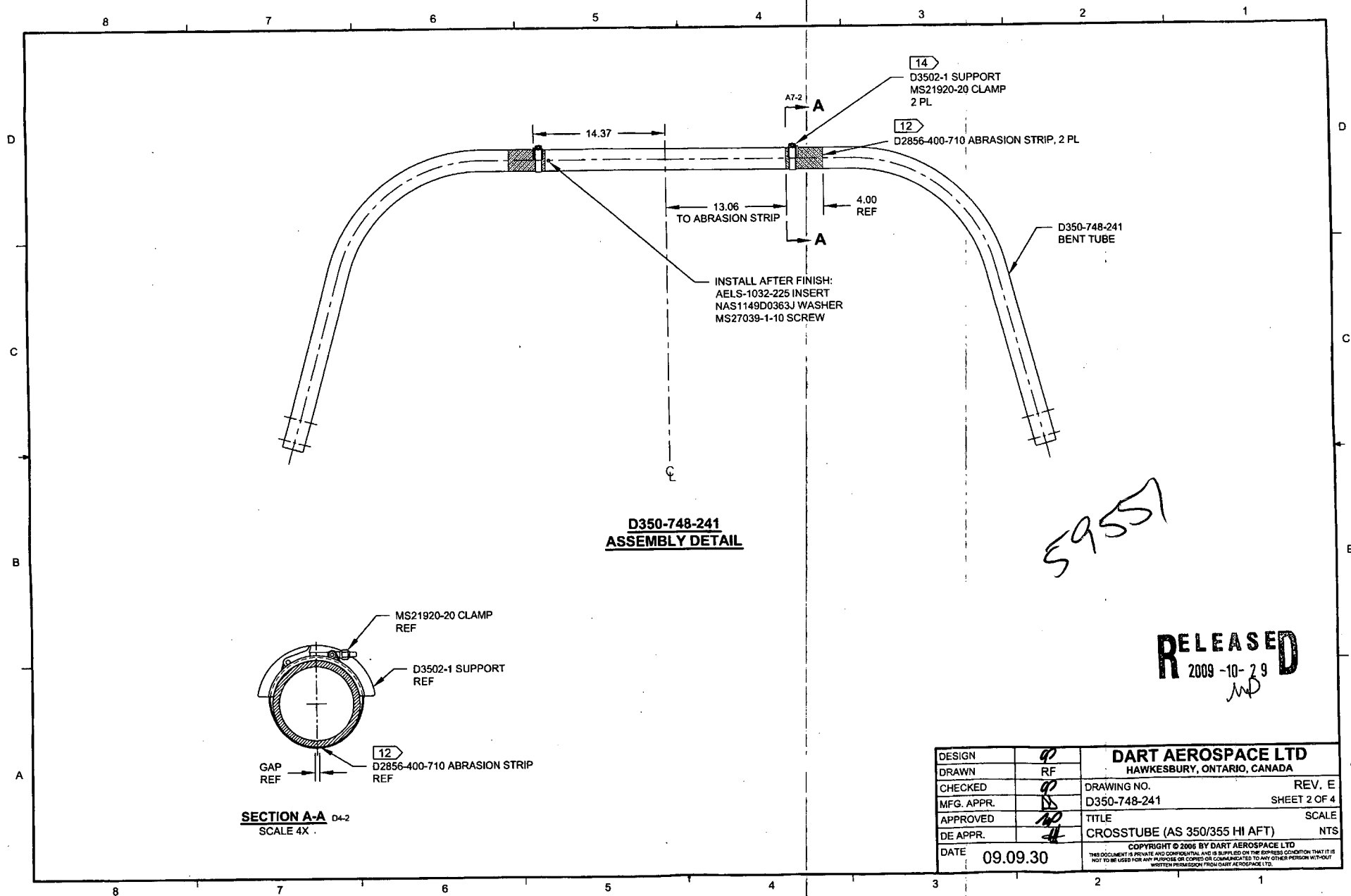
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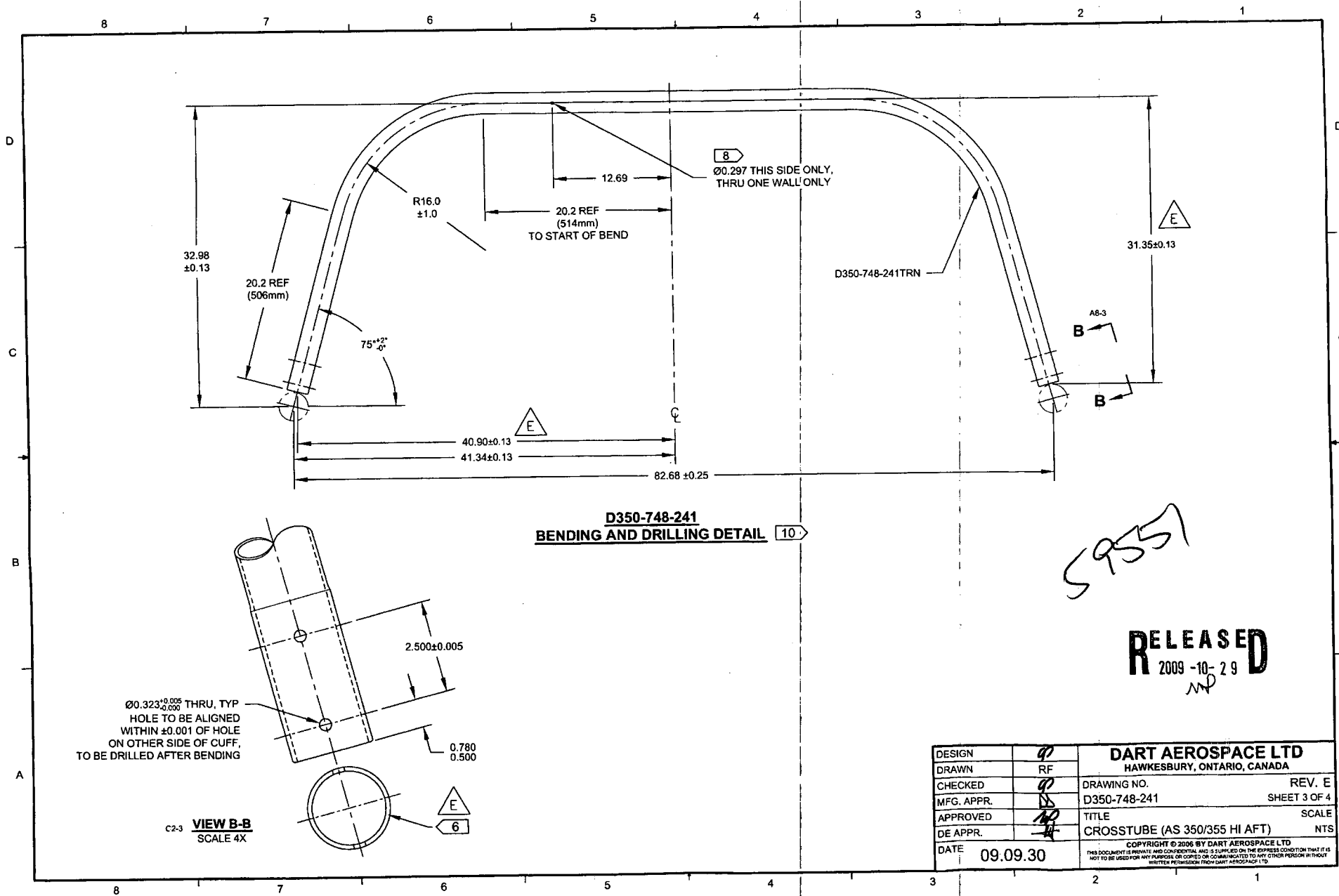
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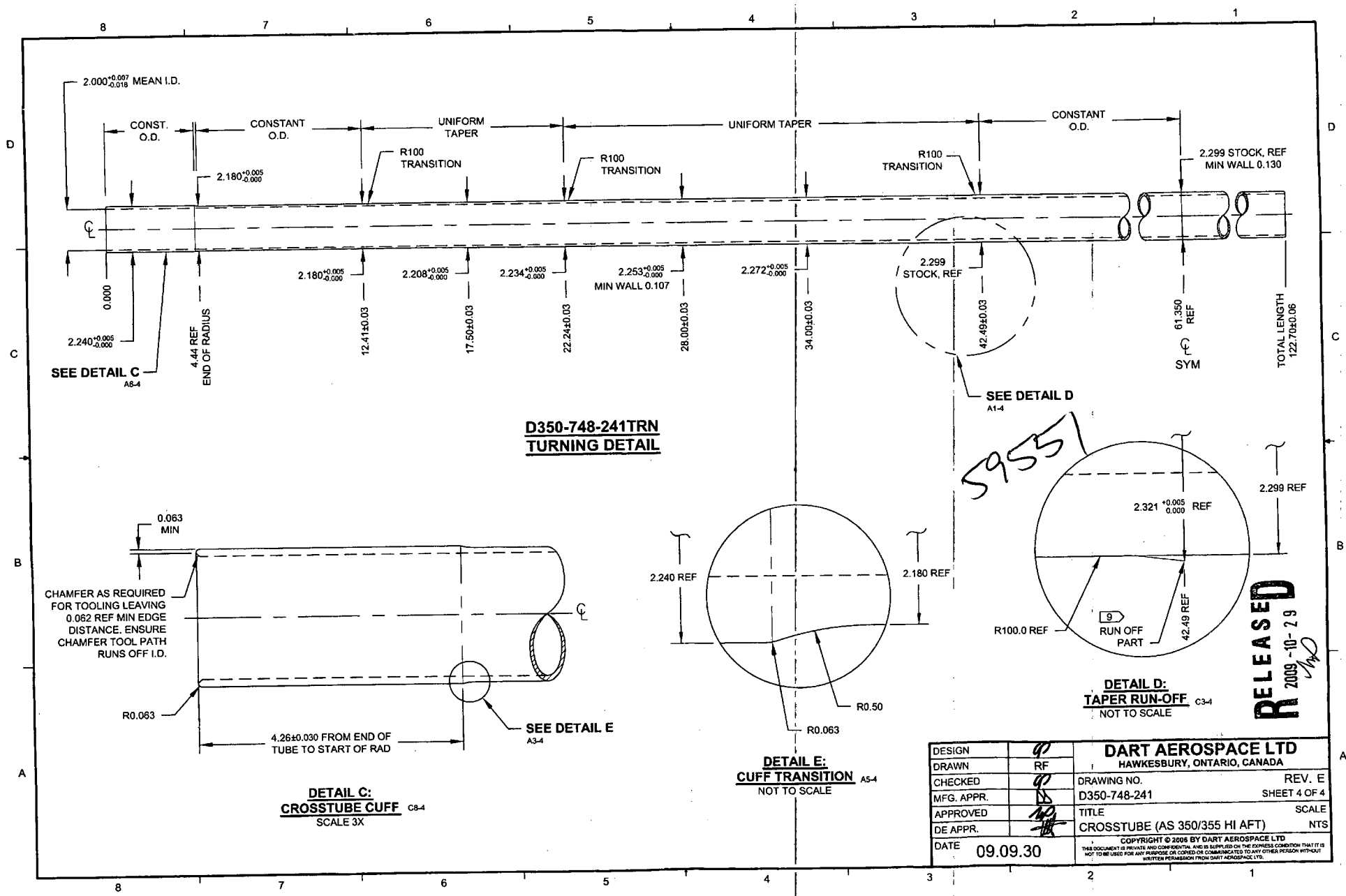
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**D350-748-241TRN
TURNING DETAIL**

SEE DETAIL D
A1-4

**DETAIL D:
TAPER RUN-OFF** C3-4
NOT TO SCALE

**DETAIL E:
CUFF TRANSITION** A5-4
NOT TO SCALE

**DETAIL C:
CROSSTUBE CUFF** C8-4
SCALE 3X

DESIGN	97	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. E
MFG. APPR.	97	D350-748-241	SHEET 4 OF 4
APPROVED	97	TITLE	SCALE
DE APPR.	97	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

RELEASED
R 2009-10-29

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VAC AERO

INTERNATIONAL INC.

RELEASE NOTE

GST No. : R105468102

OAK 121151-1



HEAD OFFICE
1371 SPEERS ROAD, OAKVILLE, ONTARIO
CANADA L6L 2X5
TEL: (905) 827-4171 FAX: (905) 827-7489



2009 WYECROFT ROAD, UNIT B
OAKVILLE, ONTARIO
CANADA L6L 6J4
TEL: (905) 827-7377 FAX: (905) 827-1380



QUEBEC DIVISION
7450 RUE VÉRITÉ STREET, ST. LAURENT, QUÉBEC
CANADA H4S 1C5
TEL: (514) 334-4240 FAX: (514) 334-6269

07/16/2010

MM/DD/YYYY

PAGE : 1

ILL TO: 1DAR01
DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY, ON

SHIP TO: DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY, ON

K6A 1K7

K6A 1K7

DATE SHIPPED	SHIP VIA	F.O.B.
07/16/2010		ORIGIN
CUSTOMER P/O No.	JOB No.	TERMS
PO12209		NET 30 DAYS

PART No.	DESCRIPTION	UOM	QTY ORD	QTY SHPD	TEST RESULTS
----------	-------------	-----	------------	-------------	--------------

D350-748 CROSS TUBE EA 16 16

Process Specifications: Procedure: 4353

HEAT TREATED TO 180 KSI MIN. PER AMS 2759-1E

100% HARDNESS TESTED AS PER ASTM E-18, 40-45 HRC

MATERIAL: 4130

SAND BLASTED AFTER HEAT TREAT

S. 10/07/23

P/N: D350-748-141: 59325, 59326, 59327, 59328, 59329, 59330, 59331, 59332

P/N: D350-748-241: 59586, 59588, 59589, 59549, 59587, 59550, 59551, 59552

100% HARDNESS TESTED

16 pcs

42/43 HRC



hereby certify that the material covered by this release note has been inspected and tested and conforms to all specifications relevant hereto in accordance with the conditions of the contract / or purchase order.

ON BEHALF OF VAC AERO INTERNATIONAL INC.



METAL TREATING INSTITUTE

Jaime Robinson
Authorized Q.C. Inspector



Accredited
Nadcap
Heat Treating • Welding

VACUUM BRAZING - HEAT TREATING - SPECIAL PROCESSING - FURNACE EQUIPMENT
TURBINE COMPONENT OVERHAUL - PLASMA AND OTHER COATINGS